



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,809	02/05/2004	Kazuya Fujita	60803(49381)	8452

7590 06/24/2005  
DAVID G. CONLIN, ESQ.  
EDWARDS & ANGELL, LLP  
P.O. BOX 55874  
BOSTON, MA 02205

EXAMINER

LOUIE, WAI SING

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/773,809	FUJITA ET AL.	
	Examiner	Art Unit	
	Wai-Sing Louie	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 17-29 and 39-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 30-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/04</u> | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Applicant's election without traverse of Group I, claims 1-16 and 30-38, in the reply filed on 4/25/05, is acknowledged. It is suggested that non-elected claims 17-19 and 39-47 be canceled in the response to this Office Action.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-6, 9, and 11, 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzawa et al. (US 6,562,669).

With regard to claims 1, 6, and 11, Suzawa et al. disclose a semiconductor device (col. 6, line 63 to col. 19, line 56 and fig. 5) having a plurality of image sensors (fig. 4) comprising:

- A solid state (CMOS circuit base) image sensor device (col. 1, lines 40-53) having an effective pixel region 502 in one surface 500 (col. 13, lines 1-4 and fig. 5b);

- A light transparent cover (top substrate in fig. 5b) arranged opposite to the effective pixel region 502 and having planar dimensions smaller than those of the solid state image pickup device (see fig. 5b);
- An adhesive section for adhering the solid-state image pickup device and the light transparent cover (col. 13, lines 9-10).

With regard to claims 3-5, 9, and 13-15, Suzawa et al. disclose a space is formed between the effective pixel region 502 and the light transparent cover (see fig. 5b), where the adhering section is formed outside the effective pixel region 502 in the one surface 500 of the solid state image pickup device and seals the outer periphery of the space (see fig. 5b).

Claims 30, 32-35, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Beyne et al. (US 6,566,745).

With regard to claims 30, 32, and 37, Beyne et al. disclose an image sensor package device (col. 5, line 31 to col. 12, line 24 and fig. 5) comprising:

- A wiring board 56 on which wiring is formed (col. 9, lines 49-51 and fig. 5i and 9);
- An image processor 52 adhered to the wiring board 56 and electrically connected to the wiring (col. 7, line 64 to col. 8, line 3 and fig. 5h);
- A solid state (CMOS) imaging device in which a light transparent cover 51 having planar dimensions smaller than those of a solid state image pickup device 52 is attached opposite to the effective pixel region of the solid state image pickup

device, and which is adhered to the image processor 52 and electrically connected to the wiring (fig. 5h);

- A sealing section 54 for resin sealing the wiring board 56 (col. 6, lines 20-26), the image processor and the solid state image device 52 in a state that the surface of the light transparent cover 51 is exposed (fig. 5i);
- An optical path (radiation through the transparent substrate 51 onto the image sensor) defining unit arranged opposite to the solid state-imaging device 52 and defining an optical path to the solid-state device (fig. 5i).

With regard to claim 33, Beyne et al. disclose the image processor 52 adhere the wiring board 56 and the external terminal connected to the wiring (col. 9, lines 49-51 and fig. 5i and 9). Inherently, the external terminals are reverse to the wiring on the surface of the wiring board that the image processor adhered to.

With regard to claim 34, Beyne et al. disclose the external terminal has a protruding shape in form of a solder ball.

With regard to claim 35, Beyne et al. disclose a wiring board 56 on which wiring is formed and where the external terminal 57 of the module component wiring board is connected to the wiring of the wiring board (fig. 5i and 9).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzawa et al. (US 6,562,669) in view of Mueller (US 5,932,058).

With regard to claims 2, 8, 10, and 12, Suzawa et al. do not disclose the adhesive is a photosensitive adhesive. However, Mueller discloses using ultraviolet light adhesive (Mueller col. 2, lines 24-25). Mueller teaches using heat-cured adhesive could distort the device during the heating in the bonding process, but the light curable adhesive will not distort the device (Mueller col. 1, lines 49-60). Therefore, it would have been obvious to one of ordinary skill in the art to modify Suzawa's device with the teaching of Mueller to use the photosensitive adhesive in the adhering section in order to prevent the distortion of the device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzawa et al. (US 6,562,669) in view of Malinovich et al. (US 6,169,319).

With regard to claim 7, Suzawa et al. do not disclose the light transparent plate is divided to form light transparent cover. However, Malinovich et al. a plurality of image sensor circuit 100 includes a matrix of light-sensitive regions 110, where the wafer is diced into individual image sensor 100 (Malinovich col. 6, lines 8-26 and fig. 3a). Malinovich et al. teach the conventional manufacturing method involves mounting the device on a permanent substrate and interconnections (Malinovich col. 4, lines 14-31), where dicing after forming a completed image sensor 100 is less costly (Malinovich col. 6, lines 23-26). Hence, it would have been obvious at the time the invention was made to modify Suzawa's device with the teaching of Malinovich et

Art Unit: 2814

al. to divide the light transparent cover and the image sensor in order to lower the manufacturing cost of the device.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzawa et al. (US 6,562,669) in view of Malinovich et al. (US 6,169,319).

With regard to claim 16, in addition to the limitations disclosed in claim 1, Suzawa et al. also disclose:

- Suzawa et al. do not disclose a lens and a lens retainer. However, Barton et al. disclose a micro-lens 130 and the lens retainer 220 opposite to each imaging sensor 120 (Barton col. 4, lines 26-38 and fig. 2a). Barton et al. teach the micro-lenses guide the light from a wider area onto the pixel region (Barton col. 1, lines 36-48). Therefore, it would have been obvious to one of ordinary skill in the art to modify Suzawa's device with the teaching of Barton et al. to provide a lens and lens retainer on each pixel in order to guide the light onto the pixel.

Claims 31, 36, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyne et al. (US 6,566,745) in view of Barton et al. (US 6,794,218).

With regard to claims 31, 36, and 38, Beyne et al. do not disclose a lens arranged opposite to the light transparent cover of the solid state-imaging device. However, Barton et al. disclose a micro-lens opposite to each imaging sensor (Barton col. 4, lines 26-38 and fig. 2a). Barton et al. teach the micro-lenses guide the light from a wider area onto the pixel region (Barton col. 1, lines 36-48). Therefore, it would have been obvious to one of ordinary skill in the

Art Unit: 2814

art to modify Beyne's device with the teaching of Barton et al. to provide a lens on each pixel in order to guide the light onto the pixel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl

June 20, 2005.